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EVALUATION OF POTATO VARIETIES AND CLONES

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EVALUATION OF POTATO VARIETIES AND CLONES IN CYPRUS, 1983-89

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SUMMARY

Potato production in Cyprus is an important industry and a significant source of foreign exchange earnings. Early potatoes represent about 50% of the total agricultural exports. Total production of ware potatoes ranges from 150 to 200 thousand metric tonnes annually. The choice of variety plays a significant role in potato production; this is particularly true for Cyprus due to her export oriented potato industry; the variety must satisfy both the grower, in terms of yield, maturity, resistance to pests and diseases etc., and the consumer, especially in terms of price and quality. With the objective of finding suitable varieties for Cyprus and in order to back the efforts of sustaining and/or expanding the potato export industry, the Agricultural Research Institute has introduced and evaluated during the period 1983-89, 215 new potato varieties and 1963 potato clones in co-operation with state and private breeding stations from the U. Kingdom, the Irish Republic, the Netherlands, Canada, the F.R. Germany, France and Belgium. The trials were conducted in farmers fields in the main potato growing area of Cyprus (Kokkinochoria area). Emphasis was given on yield and earliness, resistance to pests and diseases (late blight, virus diseases, golden nematode), and to tuber quality characters (keeping quality, size and shape, cooking, colour of skin and flesh, dry matter, appearance, physiological disorders, etc.) Considering the continuously changing production and marketing requirements and the fact that selection of a potato variety is a compromise among various factors, the following varieties were recommended for commercial and semi-commercial production: AGRIA, ATICA, CHARLOTTE, DIAMANT, ESPERANTE, LINZER DELIKATESS, LISETA, LOLA, MONA LISA, OVATIO and SIEGLINDE, together with the varieties ARRAN BANNER, CARA, NICOLA and SPUNTA, used as controls in the trials. This paper includes details on the introduction, testing and evaluation of potato varieties and clones during the period 1983-89; data on yield and quality and a brief description of the main varieties recommended for commercial and semi-commercial production are also presented.

ΠΕΡΙΛΗΨΗ

Η παραγωγή πατατών στην Κύπρο αποτελεί μιά σημαντική πηγή εισοδήματος για τον παραγωγό και εξ ίσου σημαντική πηγή συναλλάγματος για τον τόπο. Υπολογίζεται ότι το 50% του συναλλάγματος από τις εξαγωγές γεωργικών προϊόντων προέρχεται από τις εξαγωγές πρώϊμων πατατών στις χώρες της Δυτικής Ευρώπης και του Ηνωμένου Βασιλείου, και ανέρχεται σε £20 εκ. περίπου τον χρόνο. Η επιλογή της ποικιλίας στην παραγωγή πατατών έχει ιδιαίτερη σημασία τόσο από τεχνική όσο και από εμπορική άποψη. Μιά ποικιλία θα πρέπει να ανταποκρίνεται στις απαιτήσεις του παραγωγού (απόδοση, πρωϊμότης, ανθεκτικότητα σε εχθρούς και ασθένειες) αλλά και του διεθνούς εμπορίου, λαμβάνοντας υπ όψη τον οξύ ανταγωνισμό και τις συνεχώς αυξανόμενες απαιτήσεις των καταναλωτών στις διάφορες χώρες. Για ενίσχυση της όλης προσπάθειας παραγωγής και εξαγωγής πατατών και με στόχο την εξεύρεση καταλλήλων ποικιλιών που να ανταποκρίνονται στις ανάγκες του τόπου το Ινστιτούτο Γεωργικών Ερευνών έχει εισαγάγει και δοκιμάσει, κατά την περίοδο 1983-89, 215 νέες ποικιλίες και 1963 κλώνους από διάφορους σταθμούς γενετικής βελτίωσης πατατών του Η. Βασιλείου, του Καναδά, της Δ. Γερμανίας, της Ολλανδίας, της Γαλλίας, της Ιρλανδίας και του Βελγίου. Τα πειράματα έγιναν κυρίως στην περιοχή των Κοκκινοχωριών (Ξυλοφάγου, Φρέναρος, Λιοπέτρι) και στον πειραματικό σταθμό του Ινστιτούτου στην Αχέλεια, Πάφου. Η αξιολόγηση των ποικιλιών/κλώνων έγινε έχοντας υπ όψη τις ανάγκες της διεθνούς αγοράς και με βάση την προσαρμοστικότητα τους στις κυπριακές εδαφοκλιματολογικές συνθήκες. Ιδιαίτερη έμφαση δόθηκε στην απόδοση, την πρωϊμότητα, την ανθεκτικότητα σε εχθρούς και ασθένειες (περονόσπορο, ιώσεις, χρυσονηματώδη κ.λ.π.) και στην ποιότητα (μέγεθος και σχήμα κονδύλου, χρώμα σάρκας, αντοχή στη μεταφορά, εμφάνιση, χρήση, ξηρά ουσία κ.λ.π.). Σαν αποτέλεσμα της εργασίας αυτής έχουν συστηθεί για εμπορική και ημιεμπορική καλλιέργεια οι ποικιλίες AGRIA, ATICA, CHARLOTTE, DIAMANT, ESPERANTE, LINZER DELIKATESS, LISETA, LOLA, MONALISA, OVATIO και SIEGLINDE μαζί με τις ποικιλίες ARRAN BANNER, CARA, NICOLA και SPUNTA που χρησιμοποιήθηκαν σαν μάρτυρες στα πειράματα. Στη δημοσίευση αυτή περιλαμβάνονται λεπτομέρειες για την όλη πειραματική εργασία εισαγωγής και αξιολόγησης ποικιλιών και κλώνων πατατών κατά την περίοδο 1983-89 και παρουσιάζονται στοιχεία και σύντομη περιγραφή των κυριώτερων ποικιλιών που προτείνονται για εμπορική και ημιεμπορική καλλιέργεια.

INTRODUCTION

Potato production in Cyprus is an important industry and a significant source of foreign exchange earnings. Early potatoes represent about 50 percent of the total agricultural exports. Total production of ware potatoes in Cyprus ranges from 150 to 200 thousand metric tonnes and the per capita production is estimated to 300-350 kg annually.

Cyprus exports mainly early potatoes to EEC and other Western European countries and to the Middle East. Exports represent 85 to 90 % of total production. The bulk of early potatoes (spring crop) for export is produced during March/June from plantings done during November/January. Smaller quantities of early potatoes are exported during January/February (intermediate crop) from plantings done during September/October. A third crop (winter crop) from plantings done in July/August and harvested in November/December is marketed locally with small quantities exported as winter potatoes.

The choice of variety plays a significant role in potato production (Beukema and van der Zaag, 1979; Burton, 1989; Harris, 1979; Smith, 1978). This is particularly true for Cyprus, with an established and expanding export oriented potato industry. To back this export drive the search for new potato varieties has been a continuous process (Vakis, 1982).

Cyprus cannot afford to run her own potato breeding programme, therefore, she depends on the introduction and testing, under local conditions, of material bred abroad. Local testing is necessary, since the growth and development of a potato variety is considerably influenced by climatic and soil conditions (Beukema and Van der Zaag, 1979; Burton, 1989). Characters such as yield, haulm development, tuber initiation, maturity, tuber quality (cooking, frying, crisping), dry matter content etc., are highly affected by environmental and growing conditions. Factors such as emergence, number of stems, colour of skin, shape of tuber, depth of eyes, colour of flesh, resistance to pests and diseases (blight, scab, nematodes, viruses) etc., that are more or less stable, also need to be evaluated under local conditions; furthermore, the importance of each property (either stable or variable) varies from place to place depending on many factors (local conditions, intended use of the crop, etc).

To meet the changing production and marketing requirements the programme of introduction and testing of new potato varieties has been intensified during recent years. The objectives, as already indicated, are to select high yielding, early cropping and of good quality varieties with high level of resistance to important pests and diseases. The work conducted during the period 1983-89 and the results obtained are reported in this paper.

MATERIALS AND METHODS

General procedure and sources of seed

During the period 1983-89, 215 varieties and 1963 clones were introduced from Belgium, Canada, France, the Federal Republic of Germany, the Netherlands, the Irish Republic and the United Kingdom. A complete list of varieties tested is given in Appendix I.

Each season about 30 varieties were introduced for screening. Selected varieties were tested further and promising ones were recommended to the Department of Agriculture for demonstration plots. Varieties successful in the demonstration plots were then recommended to the Cyprus Potato Marketing Board for semi-commercial and commercial production.

The varieties used in the trials were mainly named varieties listed in the "National Lists" of the countries of origin or numbered varieties at an earlier stage of development (both referred to as varieties in this report). The work also included testing of a large number of clones (i.e. breeders' material, normally from the fourth year after crossing). Testing of clones is necessary in order to minimize the time from the initial cross until a variety is available for commercial production and in order to enable selection of clones that could have been otherwise discarded by the breeder under his own conditions and with his own criteria (Kehoe, 1989; Vakis, 1982).

Location

The trials were carried out in farmers fields at Xylophagou, in the main potato growing area of Cyprus. Observation trials were also carried out in farmers fields in other villages of the same area (Kokkinochoria) and at the Experiment Station of the Institute at Akhelia (Paphos).

Experimental design

All varieties were tested in replicated trials. There were four replications during the first year of introduction and eight replications during the following years (for varieties selected in the first screening). Randomized complete block designs were used. Plot size was 2.4x4.8m comprising four rows of 24 plants each. At lifting, only the two middle rows were recorded; the other two were used as guardrows and for observations during the growing period.

The clonal material (advanced clones or breeders' material) was tested in single row plots with two to four replications, depending on availability of seed. There were 10 to 20 plants per plot (row). The varieties Spunta, Cara and Arran Banner were used as controls, except for 1988 and 1989 when Nicola was substituted for Arran Banner.

Cultural practices

Planting was done by hand during late December - early January. Cut seed pieces of 30 to 40g each were used. Planting distances were 60 cm between rows and 20 cm within row. Combined fertilizers (14-22-9, 10-10-10, 12-20-7, 16-20-0) at the rate of 1500 kg/ha were applied at planting. Irrigation was by sprinklers or by minisprinklers; depending on weather conditions there were 6 to 10 irrigations per growing period. Chemical weed control and preventive sprays against late blight were made as per standard practice by the cooperating growers. In some cases, chemicals against late blight were applied through the irrigation system (minisprinklers).

Harvesting (lifting) was done by hand, after digging out the tubers with a plough.

Assessment of varieties and clones

The main criteria for selecting varieties and clones were earliness (or more accurately rate of bulking under Cyprus conditions), yield and quality. Earliness was assessed visually (colour and dying off of the foliage, setting of tuber skin) and by the rate of bulking as measured by yields obtained at an early and a late lifting. The relative changes in dry matter content were also a good indication of earliness.

During the growing period records were taken on emergence, foliage development (cover, height) and appearance, number of stems and incidence of late blight and other foliar diseases. At lifting, yield was graded into exportable (above 28mm) and non-exportable. Quality characters assessed included tuber shape and size, depth of eyes, colour of skin and flesh, dry matter and starch content, flavour, cooking quality (mealiness), after cooking discolouration, crisping quality, etc. Crisping quality was assessed on the basis of colour after slicing and frying in oil by standard methods proposed by the European Association for Potato Research (Anonymous 1978).

The varieties were also evaluated on the basis of their susceptibility to pests and diseases (golden nematode, common scab, late blight, viruses), physiological disorders (second growth, hollowheart, internal browning) and on overall impression of the tubers. The keeping quality of the most promising varieties was also assessed.

RESULTS AND DISCUSSION

Yield and maturity

Data on yield and maturity are shown in Table 1. Data are presented only for the varieties that have been tested for more than one season. Data on the varieties rejected after the first-year screening are not presented in this paper.

As stated earlier, yield and maturity (earliness) were the major criteria in choosing a variety for Cyprus, taking into account the overall structure of her export

Table 1. Yield, maturity and tuber properties of potato varieties tested at Xylophagou over the period 1983-89.

Variety	Yield* tons/ha	Maturity	Flesh colour	Shape	Dry matter content (%)	Starch content (%)
1989						
Spunta	65.0 a	Early	Yellow	Long	18.28	12.55
Lola	64.9 a	Early	Yellow	Oval long	18.82	13.06
Atica	64.9 a	Early	Yellow	Long	18.60	12.85
Diamant	62.2 ab	Medium	Yellow	Oval long	21.45	15.59
Liseta	61.3 ab	Early	Yellow	Long oval	17.64	11.93
Nicola	61.3 ab	Medium	Yellow	Long	19.35	13.57
Monalisa	56.0 bc	Early	Yellow	Long	18.71	12.96
Ovatio	55.8 bc	Medium	Yellow	Oval round	20.62	14.79
Agria	52.4 bcd	Medium	Yellow	Oval long	20.41	14.58
Arran Banner	51.9 cd	Medium	Yellow	Oval long	19.98	14.18
Sieglinde	51.1 cd	Early	Yellow	Long oval	20.41	14.58
Cara	51.6 cd	Late	White	Round oval	19.14	13.37
Charlotte	50.3 cd	Early	Yellow	Long	19.98	14.18
Linzer Delikatess	48.2 d	Early	Yellow	Long	17.96	12.24
1989						
Obelix	71.1 a	Medium	Yellow	Oval long	18.17	12.44
Mondial	70.7 a	Medium	Yellow	Long oval	18.07	12.34
Timate	70.1 ab	Medium	Yellow	Long oval	18.92	13.16
Esperante	69.8 b	Early	Yellow	Long	18.07	12.34
Spunta	68.7 b	Early	Yellow	Long	18.07	12.34
Idole	66.9 c	Medium	Yellow	Oval long	20.41	14.58
Slaney	66.0 cd	Late	White	Round oval	18.49	12.75
Liseta	65.9 cd	Early	Yellow	Round oval	18.28	12.55
Vital	64.9 de	Medium	Yellow	Round oval	19.56	13.77
Mirakel	64.4 def	Early	Yellow	Oval long	18.60	12.85
Maradonna	63.5 ef	Late	Yellow	Oval round	17.85	12.13
Accent	63.4 ef	Early	Yellow	Oval long	18.28	12.55
Smeenge 79-5	63.4 ef	Late	Yellow	Round oval	18.17	12.44
Lola	63.3 ef	Early	Yellow	Oval long	18.49	12.75
Agria	63.3 ef	Medium	Yellow	Oval long	18.60	12.85

Table 1 c/d. Yield, maturity and tuber properties of potato varieties tested at Xylophagou over the period 1983-89.

Variety	Yield* tons/ha	Maturity	Flesh colour	Shape	Dry matter content (%)	Starch content (%)
Nicola	62.8 f	Medium	Yellow	Long	19.35	13.57
Cara	59.4 g	Late	White	Round oval	19.03	13.26
Charlotte	53.5 h	Early	Yellow	Long	19.14	13.37
C1003/12	51.9 hi	Late	White	Oval round	18.49	12.75
Nieta	51.1 i	Late	Yellow	Long	20.19	14.38
Sieglinde	47.5 j	Early	Yellow	Long oval	18.82	13,06
Linzer Delikatess	46.2 j	Early	Yellow	Long	18.17	12.44
1988a						
Ariane	43.7	Medium	Yellow	Long	21.66	15.79
Liseta	42.4	Early	Yellow	Long oval	17.85	12.13
Obelix	41.0	Medium	Yellow	Oval long	18.71	12.96
Agria	40.3	Medium	Yellow	Oval long	19.03	13.26
Cara	40.3	Late	White	Round oval	20.41	14.58
Maradonna	40.3	Late	Yellow	Oval round	19.35	13.57
Sherine	40.3	Medium	Yellow	Round oval	17.20	11.51
Lola	39.3	Early	Yellow	Oval long	18.92	13.16
Idole	39.3	Medium	Yellow	Oval long	21.14	15.39
Smeenge 79-5	39.3	Late	Yellow	Round oval	18.71	12.96
Nicola	39.3	Medium	Yellow	Long	19.77	13.98
Esperante	38.3	Early	Yellow	Long	18.92	13.16
Spunta	37.0	Early	Yellow	Long	18.49	12.75
Korrigane	36.6	Medium	Yellow	Oval long	18.92	13.16
Charlotte	36.6	Early	Yellow	Long	20.19	14.38
139	35.3	Late	Yellow	Round oval	19.58	13.77
Ovatio	35.1	Medium	Yellow	Oval round	20.83	14.99
Sieglinde	33.6	Early	Yellow	Long oval	20.19	14.38
Mondial	33.6	Medium	Yellow	Long oval	17.85	12.13
Dunluce	33.6	Early	Yellow	Oval	20.62	14.79
Vital	32.6	Medium	Yellow	Round oval	21.45	15.59

a Statistical analysis was not made since many plots were missing following flooding and adverse weather conditions.

Table 1 c/d. Yield maturity and tuber properties of potato varieties tested at Xylophagou over the period 1983-89.

Variety	Yield* tons/ha	Maturity	Flesh colour	Shape	Dry matter content (%)	Starch content (%)
Ailsa	32.6	Medium	White	Round oval	20.51	14.69
Accent	31.9	Early	Yellow	Oval long	17.85	12.13
Avalanche	31.9	Late	White	Round oval	19.35	13.57
Nieta	30.2	Late	Yellow	Long	20.93	15.09
Mirakel	27.6	Early	Yellow	Oval long	18.49	12.75
Baillie	23.5	Early	White	Oval round	20.83	14.99
1987						
Mondial	56.3 a	Medium	Yellow	Long oval	16.66	10.99
Liseta	54.9 ab	Early	Yellow	Long oval	16.55	10.89
Ovatio	52.4 abc	Medium	Yellow	Oval round	18.17	12.44
Ariane	52.3 abc	Medium	Yellow	Long	19.03	13.26
Cara	50.1 abc	Late	White	Round oval	17.85	12.13
Obelix	49.6 abc	Medium	Yellow	Oval long	16.44	10.78
Kenzy	48.8 bcd	Late	Yellow	Long oval	18.49	12.75
Korrigane	48.5 bcd	Medium	Yellow	Oval long	17.85	12.13
Spunta	47.0 cde	Early	Yellow	Long	17.20	11.51
Vital	45.6 cdef	Medium	Yellow	Round oval	18.49	12.75
Esperante	45.5 cdef	Early	Yellow	Long	17.20	11.51
Allard	42.2 defg	Early	Yellow	Oval long	17.10	11.41
Venouska	42.0 defg	Early	Yellow	Long	18.07	12.34
Lutetia	40.9 efg	Early	Yellow	Oval long	18.07	12.34
Avalanche	39.4 fgh	Late	White	Round oval	18.07	12.34
Origo	37.3 gh	Early	Yellow	Oval	16.77	11.10
Charlotte	37.0 gh	Early	Yellow	Long	19.35	13.57
Ailsa	33.9 h	Medium	White	Oval round	19.56	13.77
Dunluce	33.8 h	Early	White	Oval	19.24	13.47
1986						
Creata	50.7 a	Late	Yellow	Round	19.03	13.26
Diamant	49.9 ab	Medium	Yellow	Oval long	19.88	14.08
Cara	46.9 bc	Late	White	Round oval	18.60	12.85
Spunta	45.0 cd	Early	Yellow	Long	16.55	10.89

Table 1 c/d. Yield, maturity and tuber properties of potato varieties tested at Xylophagou over the period 1983-89.

Variety	Yield* tons/ha	Maturity	Flesh colour	Shape	Dry matter content (%)	Starch content (%)
Esperante	43.3 de	Early	Yellow	Long	18.71	12.96
Ovatio	42.4 de	Medium	Yellow	Oval round	18.49	12.75
Claustar	42.4 de	Late	Yellow	Oval	17.31	11.62
Lamia	42.1 de	Early	Yellow	Oval long	19.35	13.57
Lola	41.5 def	Early	Yellow	Oval long	17.20	11.51
Allard	41.2 ef	Early	Yellow	Oval long	19.56	13.77
Mansour	41.1 ef	Early	Yellow	Oval round	18.71	12.96
Drayton	40.6 ef	Late	Yellow	Oval	19.56	13.77
Ailsa	40.0 efg	Medium	White	Oval round	19.45	13.67
Garant	39.8 efg	Early	Yellow	Round	19.35	13.57
Minerva	39.7 efg	Early	Yellow	Oval round	17.42	11.72
A. Banner	39.6 efg	Medium	White	Round	19.98	14.18
Desiree	39.3 efg	Late	Yellow	Oval long	19.56	13.77
Monalisa	38.0 fg	Early	Yellow	Long	17.74	12.03
Sahel	37.4 fg	Early	Yellow	Oval round	16.99	11.31
Superior	36.2 fg	Medium	White	Round	20.62	14.79
Shepody	32.1 h	Late	White	Oval	20.72	14.89
Jemseg	31.8 h	Early	White	Round oval	20.62	14.79
Famosa	30.5 hi	Late	Yellow	Oval	19.24	13.47
F 70021	27.2 i	Early	White	Round	19.35	13.57
1986a						
Kenzy	54.5	Late	Yellow	Long oval	17.64	11.93
Pentland Ivory	51.5	Medium	White	Oval	19.03	13.26
Drayton	48.2	Late	Yellow	Oval	19.35	13.57
Spunta	47.7	Early	Yellow	Long	16.88	11.20
Ailsa	47.4	Medium	White	Oval round	19.35	13.57
A. Banner	44.7	Medium	White	Round	19.35	13.57
Avalanche	42.5	Late	White	Round Oval	17.64	11.93
Desiree	41.9	Late	Yellow	Oval long	17.85	12.13
Sherine	40.1	Medium	Yellow	Round oval	17.64	11.93
Baillie	39.9	Early	White	Oval round	18.07	12.34
Pentland Dell	39.5	Late	White	Long oval	20.09	14.28
Dunluce	38.9	Early	Yellow	Oval	17.96	12.24

a All British varieties (except Spunta) grown on single semi-commercial plots of 500 m^2 each.

Table 1 c/d. Yield, maturity and tuber properties of potato varieties tested at Xylophagou over the period 1983-89.

Variety	Yield* tons/ha	Maturity	Flesh colour	Shape	Dry matter content (%)	Starch content (%)
1985						
Spunta	34.3 a	Early	Yellow	Long	16.77	11.10
Liseta	33.6 a	Early	Yellow	Long oval	16.99	11.31
Creata	32.5 ab	Late	Yellow	Round	16.88	11.20
Ovatio	32.3 ab	Medium	Yellow	Oval round	18.71	12.96
Lola	31.9 ab	Early	Yellow	Oval long	17.96	12.24
Jansen 75-9-1	29.9 abc	Early	White	Oval	17.74	12.03
Diamant	29.9 abc	Medium	Yellow	Oval long	19.98	14.18
235	29.7 abc	Late	White	Round	18.60	12.85
Lamia	29.6 abc	Early	Yellow	Oval long	19.35	13.57
Claustar	29.2 abc	Late	Yellow	Oval	17.10	11.41
Brunia 75-10	28.7 abc	Early	White	Oval round	19.98	14.18
Monalisa	27.9 abc	Early	Yellow	Long	17.64	11.93
284	27.7 abc	Medium	Yellow	Round oval	19.24	13.47
Vital	27.6 abc	Medium	Yellow	Round oval	17.85	12.13
664	27.1 abc	Late	White	Round oval	18.17	12.44
Sahel	26.2 abc	Early	Yellow	Round oval	17.74	12.03
10337 de 40	24.4 abc	Early	White	Long oval	17.31	11.62
BM 2101-77	23.7 abcd	Medium	Yellow	Round oval	16.23	10.57
Ailsa	22.9 bcd	Medium	White	Oval round	19.98	14.18
A. Banner	21.0 cd	Medium	White	Round	18.92	13.16
Famosa	20.6 cd	Late	Yellow	Oval	19.88	14.08
1984						
Spunta	48.0 a	Early	Yellow	Long	16.88	11.20
Cara	44.0 ab	Late	White	Round oval	19.56	13.77
Diamant	41.4 bc	Medium	Yellow	Oval long	19.56	13.77
284	41.3 bc	Medium	Yellow	Round oval	19.35	13.57
Claustar	41.0 bc	Late	Yellow	Oval	18.49	12.75
A. Banner	40.2 bcd	Medium	White	Round	19.77	13.98
Ovatio	37.7 cde	Medium	Yellow	Oval round	19.98	14.18
235	37.5 cde	Late	White	Round	19.14	13.37
BM 2101-77	37.5 cde	Medium	Yellow	Round oval	17.20	11.51
Monalisa	36.4 cdef	Early	Yellow	Long	18.71	12.96

Table 1 c/d.Yield, maturity and tuber properties of potato varieties tested at Xylophagou over the period 1983-89.

Variety	Yield* tons/ha	Maturity	Flesh colour	Shape	Dry matter content (%)	Starch content (%)
393	35.8 cdef	Late	White	Round	20.41	14.58
Vulcano	35.6 cdef	Early	Yellow	Oval	19.14	13.37
Ailsa	34.4 def	Medium	White	Oval round	20.09	14.28
Mansour	33.7 efg	Early	Yellow	Oval round	18.17	12.44
Jessica	33.4 efg	Early	Yellow	Oval round	17.42	11.72
Jansen 72-2-9	33.3 efg	Early	White	Oval	20.19	14.38
Veloka	31.8 efgh	Medium	Yellow	Oval round	20.19	14.38
Famosa	31.2 efgh	Late	Yellow	Oval	18.28	12.55
Lamia	30.2 fghi	Early	Yellow	Oval long	18.28	12.55
Carola	27.6 ghi	Early	Yellow	Oval round	18.28	12.55
VK 73-3-40	27.6 hi	Early	Yellow	Long oval	16.88	11.20
VV 72-13-160	24.4 i	Medium	White	Oval long	19.03	13.26
1983						
Cara	51.5 a	Late	White	Round oval	18.28	12.55
Spunta	50.7 a	Early	Yellow	Long	16.77	11.10
A. Banner	49.8 ab	Medium	White	Round	18.82	13.06
Avondale	48.3 abc	Late	White	Round oval	18.92	13.16
Famosa	48.1 abc	Late	Yellow	Oval	19.35	13.57
Monalisa	47.6 abcd	Early	Yellow	Long	17.96	12.24
Mansour	47.1 abcd	Early	Yellow	Oval round	18.07	12.34
284	46.2 abcde	Medium	Yellow	Round oval	19.14	13.37
Concurrent	44.4 bcdef	Early	Yellow	Oval long	17.74	12.03
Elektra	44.2 bcdef	Medium	Yellow	Oval round	16.12	10.47
Drayton	44.2 bcdef	Late	Yellow	Oval	19.03	13.26
Renska	43.2 cdef	Early	Yellow	Oval	18.28	12.55
Vulcano	42.3 cdef	Early	Yellow	Oval	17.31	11.62
Veloka	42.2 cdef	Medium	Yellow	Oval round	19.14	13.37
Diamant	41.6 def	Medium	Yellow	Oval long	19.88	14.08
L2179/29	40.3 ef	Late	White	Oval round	19.77	13.98
Jessica	40.3 ef	Early	Yellow	Oval round	18.28	12.55
Herakles	40.2 ef	Late	White	Oval round	17.53	11.82
Pentland Ivory	40.0 ef	Medium	White	Oval	19.67	13.88
Carola	39.7 f	Early	Yellow	Oval round	18.28	12.55

* Means followed by the same letter are not significantly different by Duncan's multiple range test, P=0.05.

oriented potato industry. Quality was another important factor, together with the intended use (salad potatoes, bakers, crisping etc.) Consequently some high yielding varieties appearing in Table 1 have been rejected mainly because of their late maturity or their slow bulking rate.

Tuber quality

Data on flesh colour, tuber shape, dry matter and starch content are shown in Table 1. Colour of flesh is an important factor as consumer preferences vary from market to market. Scandinavian countries prefer white fleshed varieties, Western European countries prefer yellow fleshed varieties, while the U.K. market accepts both types. Tuber shape also plays an increasingly important factor in the potato trade, the trend being toward long to oval long tubers; varieties with round tubers are in diminishing demand. As may be seen in Table 1 and particularly in years 1989 and 1988 the majority of varieties selected have long to oval long tubers.

Dry matter and starch content are particularly important to the crisping and processing industry; as shown in Table 1, under Cyprus conditions, the dry matter content ranged from 16 to 22 %, depending on variety, although other factors may significantly influence it (Vakis, 1978).

Varieties and clones selected

Taking into account that the choice of a potato variety is a compromise among several factors as discussed above, the following varieties were selected during the period 1983-89 and were classified as follows:

Varieties recommended for commercial production

Alcmaria, Aminca, Arran Banner, Baraka, Cara, Charlotte, Diamant, Jessica, Famosa, Liseta, Lola, Mansour, Marfona, Monalisa, Nicola, Ovatio, Sieglinde and Spunta.

The varieties underlined, are presently on the list of recommended varieties for the 1989-90 season. As compared to the early 1980's, there has been a drastic change of the picture of commercially grown varieties. This reflects the changing production and marketing requirements and also dictates the need for sustained efforts for the introduction and testing of new varieties.

Varieties recommended for semi-commercial production

Agria, Atica, Avondale, Esperante, Linzer Delikatess, No. 284, Renska, Sherine.

Varieties underlined are presently on the list of recommended varieties for semi-commercial production during 1989-90.

Varieties for further testing

Accent, Cosmos, Impala, Mirakel, Mondial, Obelix, Osirene, Pamina, Rocket, Secura, Slaney, Timate, 77-66-102.

Clones

Fifty, mainly early maturing, clones have been selected for further testing, out of the 1963 introduced during the period 1983-89. Three clones have been already reached the variety status and were named Slaney, Sperrin and Toledo.

Horticultural features of the main varieties selected

A brief description of the main varieties selected is given in Appendix II. Emphasis is given on agronomic features and varietal performance under Cyprus conditions; it was not attempted to make any morphological or botanical description, which have been already made by the breeders. Most of these varieties are listed in the "National Lists" (or Catalogues) of their country of origin (Anonymous 1989, 1986, 1981, 1965, 1955) from which information was drawn on pest and disease resistance for some of the varieties described in this report.

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Belgium	:	N.V. Binst Breeding and Selection Sa.
Canada	:	Agriculture Canada.
France	:	GOPEX (Societe Co-operative D'Interet Collectif Agricole), UNICOPA.
F.R.Germany	:	Kartoffelzucht Bohm, POTATEX, Solana Agrar-Produce.
Holland	:	Agrico, Cebeco, Den Hartigh B.V., Hettema zonen B.V. Meijer C.B.V., NIVAA, RIVRO, Stet and Slot, Van Rijn, Wolf and Wolf BV, Zpc.
Irish Republic	:	The Agricultural Institute (Oakpark Research Centre), The Irish Potato Marketing.
United Kingdom	:	Agrimarketing Ltd (N. Ireland), Caithness Potato Breeders Ltd., The Northern Ireland Plant Breeding Station (Department of Agriculture), Potato Marketing Board (PMB), Plant Breeding International (PBI), Scottish Crop Research Institute (SCRI), Seed Potato Promotions (N. Ireland).

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Appendix Table I. Alphabetical list of potato varieties tested during 1983-89

Variety	Country of origin
Accent	Holland
Adora	Holland
Agria	W. Germany
Ailsa	Scotland
Allard	Holland
Alwara	W. Germany
Angela	W. Germany
Ariane	France
Arran Banner	N. Ireland
Atica	W. Germany
Avalance	N. Ireland
Avanti	Holland
Avondale	Ireland
Baillie	Scotland
Berber	Holland
BM 2101-77	Holland
BM 286-78	Holland
BM 2230-77	Holland
BM 945-77	Holland
BM 77-549	Holland
Bonita	W. Germany
Bright	Holland
Brunia 72-15	Holland
Brunia 75-10	Holland
Brunia 75-93-10	Holland
BS 88.1	Belgium
Cara	Ireland
Carlingford	N. Ireland
Carola	W. Germany
Charlotte	France
Christa	W. Germany
Cinja	W. Germany
Clarissa	W. Germany
Claustar	France
Comtesa	Holland
Concorde	Holland
Concurrent	Holland
Cosmos	Holland
Creata	Holland
DE-NYS 77-5-29	Holland

Variety	Country of origin
Desiree	Holland
DHS 75-1-5	Holland
Diamant	Holland
Drayton	Scotland
Drundrod	N. Ireland
Dundrum	N. Ireland
Dunja	W. Germany
Dunluce	N. Ireland
Edzina	Holland
Elektra	Holland
Empire	Holland
Escort	Holland
Esperante	Holland
Fambo	Holland
Famosa	Holland
Fanette	France
Flamenco	Holland
Flevostar	Holland
Forelle	Holland
Foxton	Scotland
Frisia	Holland
Garant	Holland
Gasore	Belgium
GE 76-861	Holland
GRE 73-575	Holland
Grov 79-5-6	Holland
HB 81/36	Holland
Heracles	Holland
Hilta	W. Germany
Idole	Holland
Impala	Holland
Inge	W. Germany
Iroise	France
Isabel	W. Germany
Isna	W. Germany
Isola	Holland
Jansen 72-2-9	Holland
Jansen 75-704-1	Holland
Jemseg	Canada
Jessica	W. Germany

Variety	Country of origin
Judith	Belgium
Kenzy	Scotland
Klondyke	Holland
Korrigane	France
Kramer 76-42-12	Holland
Lamia	Belgium
Landia	France
Larga	Holland
Leyla	W. Germany
Linzer Delikatess	Holland
Liseta	Holland
Lizen	France
Lola	France
Lutetia	Holland
Lyra	W. Germany
MA 77-148	Holland
Mansour	Holland
Maradonna	Holland
Mariana	France
Mirakel	Holland
Monalisa	Holland
Mondial	Holland
Morgane	France
Nadia	Scotland
Navan	Scotland
Nelka	Holland
Nicola	Holland
Nieta	N. Ireland
Obelix	Holland
Origo	Holland
Osirene	France
Otello	Holland
Ovatio	Holland
Palma	W. Germany
Pamina	France
Penta	Holland
Pentland Dell	Scotland
Pentland Ivory	Scotland
Pentland Javelin	N. Ireland
Pepita	France
Picasso	Holland
Planta	W. Germany

Variety	Country of origin
Primel	France
Primereine	France
Renska	Holland
Rikea	Holland
Rocket	Scotland
Ropta 441	Holland
Roseval	France
Sahel	France
Sampa	France
Sanora	Holland
SB-75-10	Holland
Scala	W. Germany
Secura	W. Germany
Shepody	Canada
Sheriff	N. Ireland
Sherine	Scotland
Shula	Scotland
Sieglinde	W. Germany
Sirtebe	Belgium
Slaney	Ireland
Smeenge 79-5	Holland
Sperrin	N. Ireland
Spunta	Holland
Stemster	Scotland
Superior	Canada
Sylvana	Holland
Tarzan	Holland
Timate	Holland
Toledo	N. Ireland
Torridon	Scotland
Turbo	Holland
VDR 74-8	Holland
Veloka	Holland
Venouska	Holland
Ventura	Holland
Vital	Holland
Vivaks	Holland
Vulcano	Holland
VV 72-13-160	Holland
Yesmina	Belgium
75-1-69	Holland
77/67/102 OLD	Holland

Variety	Country of origin
284	Ireland
AJ 74-1-20	Holland
YP 77-189	Holland
73-147-46	Holland
72-14-61	Holland
73-890	Holland
544/78L	W. Germany
647/54	W. Germany
647/55	W. Germany
647/56	W. Germany
945 L	W. Germany
152/2	W. Germany
82/143	W. Germany
L2179/29	N. Ireland
4563/42	N. Ireland
4389/16	N. Ireland
5001 A79	N. Ireland
4994/26	N. Ireland
4710/18	N. Ireland
4995/II	N. Ireland
4714/4	N. Ireland
4706/46	N. Ireland
4996/16	N. Ireland
4651/3	N. Ireland
AG 79-12-22	N. Ireland
AG 79-10-16	N. Ireland
79/2/7	N. Ireland
79/17/10	N. Ireland
81/27/11	N. Ireland
11566 ac 7	Scotland
10333 ab 18	Scotland
9869 ag	Scotland
10337 de 40	Scotland
11305 a2	Scotland
11233 ab 22	Scotland
284	Ireland
463	Ireland
531	Ireland
474	Ireland
664	Ireland
235	Ireland
393	Ireland
139	Ireland
330	Ireland
766	Ireland
C1107/127	Ireland
C1003/12	Ireland
F 74123	Canada
F 70021	Canada

Appendix Table II. Potato varieties selected during the period 1983-89

a. Varieties recommended for commercial and semi-commercial production

AGRIA (Quarta x Selmo)

Origin	:	F.R. Germany
Plant	:	Stems 3-4, thick. Leaves rather large, drooping, dark green. Inflorescences fairly large and numerous. Few white flowers
Maturity	:	Medium
Yield	:	Very good
Tubers	:	Medium to large size, oval-long. Yellow, predominantly smooth skin. Shallow eyes. Flesh yellow
Dry matter	:	High
Crisping quality	:	Very good; creamy crisps
Diseases	:	Moderately susceptible to leaf blight, slightly susceptible to tuber blight. Very good resistance to virus Y and A. Immune to virus X. Resistant to potato root eelworm (Biotype A)
Remarks	:	Firm cooking, fine taste. Excellent quality for all kinds of processing. Recommended for semi-commercial production

ATICA (Rheinhort x Clon 361/58)

Origin	:	F.R. Germany
Plant	:	Stems 2-3, thick. Leaves rather large, rigid, greyish dark green. Inflorescences sturdy rather numerous
Maturity	:	Early
Yield	:	High
Tubers	:	Medium size, long. Yellow, predominantly smooth skin. Shallow eyes. Flesh yellow
Dry matter	:	Low to medium
Crisping quality	:	Fair, medium brown crisps
Diseases	:	Moderately susceptible to leaf blight; tuber less susceptible. High resistance to leaf roll and virus Y. Very good resistance to virus A and to common scab
Remarks	:	Recommended for semi-commercial production

CARA (Ulster Glade x A 25/19)

Origin	:	Ireland
Plant	:	Stems 3-4, thick and long. Leaves medium, rather drooping, green. Inflorescences numerous with many white flowers
Maturity	:	Very late
Yield	:	High

Tubers	:	Medium to large size, round oval. Skin white with reddish pink shallow eyes. Flesh white
Dry matter	:	Medium
Crisping quality	:	Good, light brown crisps
Diseases	:	Very resistant to leaf and tuber blight. Immune to virus X. Very resistant to virus Y. Tolerant to leaf roll virus. Resistant to potato root eelworm (Biotype A)
Remarks	:	Recommended for commercial production

CHARLOTTE (Hansa x Danae)

Origin	:	France
Plant	:	Stems 2-3, medium. Leaves medium rather drooping, green. Inflorescences rather small and numerous with violet flowers
Maturity	:	Early
Yield	:	Very good
Tubers	:	Medium size, long. Very regular skin, yellow. Eyes shallow. Flesh yellow
Dry matter	:	High
Crisping Quality	:	Good, light brown crisps
Diseases	:	Fairly resistant to foliage and tuber blight. Resistant to virus A. Fairly resistant to virus Y. Fairly susceptible to leaf roll
Remarks	:	Excellent quality for all kinds of processing. Salad potato. Recommended for commercial production

DIAMANT (S.4-30-8 x 5589)

Origin	:	Holland
Plant	:	Stems 3-4, thick. Leaves rather large, rigid, greyish to dark green. Inflorescences sturdy, rather numerous with red purple flowers
Maturity	:	Medium
Yield	:	High
Tubers	:	Medium size, long oval, slightly tapering. Yellow, predominantly rough skin. Eyes shallow. Flesh yellow
Dry matter	:	High
Crisping quality	:	Good, light brown crisps
Diseases	:	Moderately susceptible to leaf blight; tubers less susceptible. Immune to wart disease and virus A. Resistant to potato root eelworm (Biotype A)
Remarks	:	Recommended for commercial production

ESPERANTE (Primura x AM66-42)

Origin	:	Holland
Plant	:	Stems 3-4, thick. Leaves fairly small, rather drooping, green. Inflorescences fairly rare, rather small with very few white flowers

Maturity	:	Early
Yield	:	High
Tubers	:	Large size, long. Regular skin. Eyes shallow. Flesh yellow
Dry matter	:	Low
Crisping quality	:	Fair, medium brown crisps
Diseases	:	Slightly susceptible to leave blight; very slightly susceptible to tuber blight. Slightly susceptible to virus X; moderately susceptible to virus Y. Slightly susceptible to common scab. Resistant to potato root eelworm (Biotype A)
Remarks	:	Recommended for semi-commercial production

LINZER DELIKATESS (Sieglinde x Zuck-Stamm)

Origin	:	Austria
Plant	:	Stems 3-4, thin. Leaves medium, rather drooping, light green. Inflorescences rather small and numerous
Maturity	:	Early
Yield	:	Very good
Tubers	:	Medium to small size, long with abnormal shape. Yellow rough skin, somewhat tapering. Eyes shallow. Flesh yellow
Dry matter	:	Low
Crisping quality	:	Fair, medium brown crisps
Diseases	:	Susceptible to leaf blight. Slightly susceptible to the tuber blight. Resistant to wart disease
Remarks	:	Suitable for salads, frying and boiling; excellent taste. Recommended for semi-commercial production

LISETA (Spunta X SVP Ve 66295)

Origin	:	Holland
Plant	:	Stems 3-4, thick. Leaves rather large, rather drooping, light green. Inflorescences small with few white flowers
Maturity	:	Early (fast bulking rate)
Yield	:	High
Tubers	:	Large, long-oval, slightly tapering. Yellow, predominantly smooth skin. Eyes shallow. Flesh yellow
Dry matter	:	Low
Crisping quality	:	Fair to good, light brown crisps
Diseases	:	Susceptible to leaf blight; slightly susceptible to to tuber blight. Very good resistance to virus Y. Resistant to potato eelworm (Biotype A)
Remarks	:	Recommended for commercial production

LOLA (Spunta x Claustar)

Origin	:	France
Plant	:	Stems 2-3, thick. Leaves rather large, rather drooping, green. Inflorescences rather small
Maturity	:	Early (fast bulking rate)
Yield	:	High
Tubers	:	Large, oval long. Skin yellow regular. Eyes shallow Flesh yellow
Dry matter	:	Medium
Crisping quality	:	Fair, medium brown crisps
Diseases	:	Fairly susceptible to leaf blight and susceptible to tuber blight. Fairly susceptible to common scab. Susceptible to virus V and to leaf roll
Remarks	:	Susceptible to cracking resulting from irregular irrigations. Recommended for commercial production

MONALISA (Bierma Al-287 X Colmo)

Origin	:	Holland
Plant	:	Stems 3-4, rather thick. Leaves fairly large, rather drooping, light green. Inflorescences fairly small and rather few with white flowers
Maturity	:	Early
Yield	:	Very good to high
Tubers	:	Medium size, long oval, slightly kidney shaped
Dry matter	:	Low to medium
Crisping quality	:	Fair, medium brown crisps
Diseases	:	Susceptible to leaf blight, moderately susceptible to tuber blight. Very good resistance to virus Y, fairly resistant to leaf roll; immune to virus A and wart disease
Remarks	:	Recommended for commercial production

NICOLA (Clivia x 6430/1011)

Origin	:	F.R. Germany
Plant	:	Stems 2-3, thick. Leaves fairly small, rigid, light green. Inflorescences small with few white flowers
Maturity	:	Medium
Yield	:	High
Tubers	:	Medium to large size, long. Smooth, yellow skin. Eyes shallow. Flesh yellow
Dry matter	:	Medium
Crisping quality	:	Fair, dark brown crisps
Diseases	:	Fairly susceptible to leaf blight, only slightly susceptible to tuber blight. Immune to virus A and X. Immune to wart disease. Resistant to potato root eelworm (Biotype A)
Remarks	:	Recommended for commercial production

OVATIO (Renova x Alcmaria)

Origin	:	Holland
Plant	:	Stems 3-4, medium to thick. Leaves rather large, drooping, dark green. Inflorescences large, numerous with white flowers
Maturity	:	Medium
Yield	:	High
Tubers	:	Medium to large size, oval flat to round. Somewhat netted, brownish-yellow skin. Shallow eyes. Flesh yellow
Dry matter	:	High
Crisping quality	:	Good, light brown crisps
Diseases	:	Susceptible to leaf blight; slightly susceptible to tuber blight. Resistant to wart diseases; good common scab resistance. Good resistance to virus diseases. Resistant to potato root eelworm (Biotype A)
Remarks	:	Recommended for commercial production

SIEGLINDE (Semis x Juli)

Origin	:	F.R. Germany
Plant	:	Stems 3-4, medium. Leaves medium, rather drooping, light green. Inflorescences rather small and numerous
Maturity	:	Early
Yield	:	Very good
Tubers	:	Small to medium size, long oval. Yellow, predominantly rough skin. Eyes shallow. Flesh yellow
Dry matter	:	High
Crisping quality	:	Fair, medium brown crisps
Diseases	:	Susceptible to foliage blight. Fairly susceptible to tuber blight and to common scab. Slightly susceptible to virus Y and very susceptible to leaf roll
Remarks	:	Fine cooking quality. Suitable for salads, frying and boiling; excellent taste and flavour. Recommended for commercial production

SPUNTA (Bea x USDA x 96-56)

Origin	:	Holland
Plant	:	Stems 2-3, thick. Leaves fairly small, rather drooping, dark green. Inflorescences rather small with very few white flowers
Maturity	:	Early (fast bulking rate)
Yield	:	High
Tubers	:	Very large, long, somewhat tapering, skin yellow. Eyes very shallow. Flesh yellow
Dry matter	:	Low
Crisping quality	:	Fair, medium brown crisps
Diseases	:	Moderately susceptible to leaf blight. Slightly susceptible to tuber blight. Fairly susceptible to leaf roll. Fairly resistant to virus Y. Immune to virus A and wart disease

Remarks : Recommended for commercial production

b. Varieties selected for further testing

Accent : Early. Oval long, large tubers. Eyes shallow. Flesh yellow. Yield medium to high. Dry matter content low.

Impala : Early. Long, large tubers. Eyes shallow. Flesh yellow. Yield high. Dry matter content low to medium.

Mirakel : Early. Oval long, large tubers. Eyes shallow. Flesh yellow. Yield high. Dry matter content low. Resistant to potato root eelworm (Biotype A).

Mondial : Medium to late. Long oval, large tubers. Eyes shallow Flesh yellow. Yield high. Dry matter content low. Resistant to potato root eelworm (Biotype A).

Obelix : Medium. Oval long, large tubers. Eyes shallow. Flesh yellow. Yield high Dry matter content low.

Penta : Medium. Round oval, medium to large tubers. Eyes medium deep, reddish pink. Flesh yellow. Yield medium to high. Dry matter content medium. Reristant to potato root eelworm (Biotype A).

Slaney : Late. Round oval, large tubers. Eyes shallow. Flesh white. Yield high. Dry matter content medium.

Timate : Medium. Long oval, large tubers. Eyes shallow. Flesh yellow. Yield high. Dry matter content medium.

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